

LLOYDS RESERVOIR



Introduction

Lloyds Lake is an impoundment on the east slope of the Abajo Mountains. Twenty-eight million years ago, molten rock pushed up through the horizontal strata of this area of what is now the Colorado Plateau. The lava blistered the horizontal rock strata, and eventually burst through the surface. The area has since been uplifted and eroded, leaving a rugged mountain range. The runoff from the high mountains where the majority of precipitation

occurs has cut stream valleys through the lowland area at the base of the mountains.

The Mormon pioneers settled the area in the late 1800's, and diverted water from the mountain streams for irrigation. South Creek was impounded to form Lloyds

Characteristics and Morphometry

Lake elevation (meters / feet)	2,151 / 7,055
Surface area (hectares / acres)	42.08 / 104
Watershed area (hectares / acres)	4,040 / 9,984
Volume (m ³ / acre-feet)	4,316,700 / 3,500
capacity	
conservation pool	
Annual inflow (m ³ / acre-feet)	
Retention time (years)	
Drawdown (m ³ / acre-feet)	
Depth (meters / feet)	
maximum	20.2 / 66.3
mean	10.3 / 33.8
Length (meters / feet)	1,685 / 5,527
Width (meters / feet)	532 / 1,742
Shoreline (meters / feet)	6,096 / 20,000

Location

County	San Juan
Longitude / Latitude	109 23 13 / 37 49 44
USGS Map	Monticello South, Utah (not on map) 1985
Atlas	pg.46,B2
Cataloging Unit	Montezuma Creek (14080203)

Lake in the early 1980's to retain spring runoff for culinary and agricultural purposes during the summer. It is a intermediate size reservoir, also known as Loyds Lake or Monticello Reservoir.

The reservoir shoreline is privately owned. Currently public access is unrestricted. The impoundment, an earth-fill dam, was built in 1984 at a cost of \$3,588,000. Water use priorities are 1) supplemental culinary water for Monticello City, 2) agricultural uses, and 3) water-based recreation.

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Recreation

Lloyds Lake is two miles southwest of Monticello. Travel west from downtown on Blue Mountain North Creek Road (FS-105) which goes high in the Abajos. One half mile past a secondary school on the right (at 200 W in Monticello), turn left on a gravel road and go one mile to the reservoir.

The lake offers primarily fishing and boating. The area immediately around the lake offers primitive camping. There are two USFS campgrounds several miles west on FS-105. Dalton Springs is 4 miles west and has 16 campsites, picnic areas, drinking water, and vault toilets. User fees are charged. Buckboard, 5 miles west, is more primitive and has 13 campsites. There are several private campgrounds in Monticello.

Watershed Description

Lloyds Lake is in a shallow canyon in the transition zone between the arid plains east of Monticello and the Abajo Mountains. During periods of high erosion in the last ice age, alluvial fans accumulated in these zones. In the 10,000 years since, streams have cut shallow canyons through the alluvium. Lloyds Lake is an impoundment of one such canyon.

The watershed high point, Abajo Peak, is 3,463 m (11,360 ft) above sea level, thereby developing a complex slope of 16.6% to the reservoir. The inflows are South Creek, Pole Creek and Shingle Mill Draw. South Creek is the only perennial inflow. The outflow is also South Creek, but immediately downstream North and South Creeks confluence to become Montezuma Creek. The average stream gradient above the reservoir is 6.1% (322 feet per mile).

The soil is of limestone origin with rapid permeability and erosion is rapid. See appendix III for a complete soil description.

The vegetation communities are comprised of spruce-fir, aspen, pine, alpine, and pinyon-juniper with grasses and forbes near the reservoir. The watershed receives 30 - 51 cm (12 - 20 inches) of precipitation annually with a frost-free season of 100 - 120 days at the reservoir.

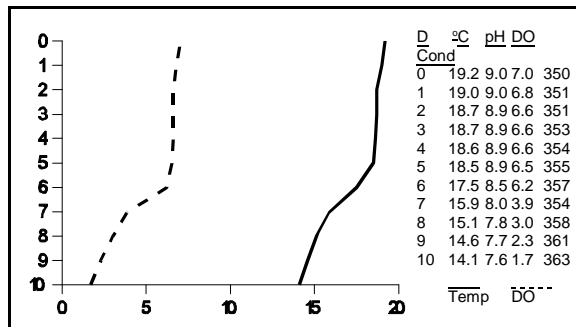
Land use is 100% multiple use. The major use of the watershed is livestock grazing.

Limnological Assessment

The water quality of Lloyds Reservoir is good. It is considered to be moderately hard with a hardness concentration value of approximately 115 mg/L (CaCO₃). The only parameters that has exceeded State water quality standards for defined beneficial uses are phosphorus and dissolved oxygen. The concentrations in May and August of 1990 at the deep site were 48 and 133.3 ug/L for an average of 90.6 which exceeds the

Limnological Data			
Data averaged from STORET sites: 595825, 595826			
Surface Data	1989	1990	1991
Trophic Status	M	E	M
Chlorophyll TSI	41.69	43.89	35.36
Secchi Depth TSI	61.54	55.93	64.99
Phosphorous TSI	37.69	53.86	27.35
Average TSI	46.98	51.23	42.57
Chlorophyll <i>a</i> (ug/L)	3.1	3.1	1.7
Transparency (m)	0.9	1.6	0.75
Total Phosphorous (ug/L)	10	24	5
pH	8.3	8.3	8.6
Total Susp. Solids (mg/L)	9.6	3	6
Total Volatile Solids (mg/L)	-	7	2
Total Residual Solids (mg/L)	-	25	4
Temperature (°C / °f)	16/61	15/59	18/65
Conductivity (umhos.cm)	327	301	359
Water Column Data			
Ammonia (mg/L)	0.02	0.06	0.03
Nitrate/Nitrite (mg/L)	-	0.01	0.01
Hardness (mg/L)	148	143	168
Alkalinity (mg/L)	121	107	117
Silica (mg/L)	-	9.3	7.6
Total Phosphorous (ug/L)	13	89	9
Miscellaneous Data			
Limiting Nutrient	N	N	N
DO (Mg/l) at 75% depth	0.7	-	3.7
Stratification (m)	9-11	NO	6-7
Depth at Deepest Site (m)	24.0	14.0	9.7

recommended pollution indicator for phosphorus of 25



ug/L. The phosphorus concentration during 1990 appears to be atypical. A complete profile of the reservoir is not available for 1990 to determine if anoxic conditions were present thereby giving rise to the high total phosphorus concentrations. A review of the profile for August 7, 1991 does indicate that the reservoir can stratify and anoxic conditions could develop inducing the movement of phosphorus from the sediments. Dissolved oxygen concentrations in late summer (1991) substantiate the fact that water quality impairments do exist. Concentrations decline gradually throughout the water column to a low of 1.7 mg/L. It is evident that additional data will need to be obtained to establish actual limnological conditions. The reservoir is characterized as a nitrogen limited system. TSI values indicate the reservoir is mesotrophic but eutrophic conditions do exist as indicated in 1990.

According to DWR no fish kills have been reported in recent years. The DWR stocks the reservoir annually with

about 7,000 advanced fingerling rainbow trout (*Oncorhynchus mykiss*). The reservoir has not been chemically treated by the DWR to control rough fish competition, so native populations from South Creek may be present in the reservoir.

Phytoplankton in the euphotic zone include the following taxa (in order of dominance)

Species	Cell Volume (mm ³ /liter)	% Density By Volume
<i>Dinobryon divergens</i>	0.365	50.0
<i>Scenedesmus bijuga</i>	0.171	23.5
Pennate Diatoms	0.137	18.7
Unknown Chrysophyte	0.038	5.2
<i>Asterionella formosa</i>	0.009	1.2
Unknown Green Flagellate	0.004	0.6
<i>Ankistrodesmus falcatus</i>	0.004	0.6
Total	0.728	
Shannon-Weaver Index [H']	1.27	
Species Evenness	0.65	
Species Richness [d]	0.29	

The flora dominated by golden algae, green algae and diatoms, is more diverse than most Utah lakes. Algal biomass is low and not a problem indicative of good water quality.

Pollution Assessment

Nonpoint pollution sources are: sedimentation and nutrient loading from grazing, human wastes and litter from recreation. Cattle graze in the watershed and around the reservoir.

There are no point pollution sources in the watershed.

Information

Management Agencies

Bureau of Land Management	539-4001
San Juan Resource Area (Monticello)	587-2141
Southeastern Utah Association of Governments	687-5444
Division of Wildlife Resources	538-4700
Division of Water Quality	538-6146

Recreation

Canyonlands Travel Region (Monticello)	587-2231
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Reservoir Administrators

San Juan County Water Conservation District	678-2596
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Beneficial Use Classification

The state beneficial use classifications include: culinary water (1C), boating and similar recreation (excluding swimming) (2B), cold water game fish and organisms in their food chain (3A) and agricultural uses (4).

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